National Institute of Environmental Health Sciences

Trends in prevalence of allergic rhinitis and correlation with pollen counts in Switzerland

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Year: 2008
Journal: International Journal of Biometeorology. 52 (8): 841-847

Abstract:

In recent decades, a large number of epidemiological studies investigating the change of prevalence of hay fever showed an increase in the occurrence of this disease. However, other studies carried out in the 1990s yielded contradictory results. Many environmental factors have been hypothesized to contribute to the increasing hay fever rate, including both indoor and ambient air pollution, reduced exposure to microbial stimulation and changes in diets. However, the observed increase has not convincingly been explained by any of these factors and there is limited evidence of changes in exposure to these risk factors over time. Additionally, recent studies show that no further increase in asthma, hay fever and atopic sensitisation in adolescents and adults has been observed during the 1990s and the beginning of the new century. As the pattern of pollen counts has changed over the years, partly due to the global warming but also as a consequence of a change in the use of land, the changing prevalence of hay fever might partly be driven by this different pollen exposure. Epidemiological data for hay fever in Switzerland are available from 1926 until 2000 (with large gaps between 1926 and 1958 and 1958 to 1986) whereas pollen data are available from 1969 until the present. This allows an investigation as to whether these data are correlated provided the same time spans are compared. It would also be feasible to correlate the pollen data with meteorological data which, however, is not the subject of our investigation. Our study focuses on analyzing time series of pollen counts and of pollen season lengths in order to identify their trends, and to ascertain whether there is a relationship between these trends and the changes in the hay fever prevalence. It is shown in this paper that the pollen exposure has been decreasing in Basel since the beginning of the 1990s whereas the rate of the hay fever prevalence in Switzerland remained approximately unchanged in this period but with a slight tendency to decrease. In Locarno, most of the pollen species also show a decreasing trend, while in Zurich, the development is somewhat different as the pollen counts of most of the pollen types have been increasing. It is interesting, however, that some of the pollen counts of this station (grass, stinging nettle, mugwort and ragweed) have been decreasing in the period 1982--2007.

Source: http://dx.doi.org/10.1007/s00484-008-0178-z

Resource Description

Exposure :

weather or climate related pathway by which climate change affects health

Air Pollution, Temperature

Air Pollution: Allergens

Temperature: Fluctuations

Geographic Feature:

resource focuses on specific type of geography

None or Unspecified

Geographic Location:

resource focuses on specific location

Non-United States

Non-United States: Europe

European Region/Country: European Country

Other European Country : Switzerland

Health Impact:

specification of health effect or disease related to climate change exposure

Respiratory Effect

Respiratory Effect: Upper Respiratory Allergy, Other Respiratory Effect

Respiratory Condition (other) : allergic rhinitis

Resource Type:

format or standard characteristic of resource

Research Article

Timescale:

time period studied

Time Scale Unspecified